

In the Claims:

CLAIMS

1. (Cancelled)
2. (Previously Presented) A composition comprising reaction products from a reaction of a ricinoleic acid with a compound containing a hydroxyl functional group in the presence of a phosphorus-containing acid, the reaction products including a transesterified fatty acid ester and a phosphorus-containing compound.
3. (Cancelled)
4. (Previously Presented) The composition of claim 2 wherein castor oil is used in the reaction to supply the ricinoleic acid.
5. (Original) The composition of claim 4 wherein the castor oil contains at least about 80 percent ricinoleic acid.
6. (Cancelled)
7. (Cancelled)
8. (Cancelled)
9. (Previously Presented) The composition of claim 2 wherein the transesterified fatty acid ester includes ricinoleic n-propyl ester.
10. (Cancelled)
11. (Previously Presented) The composition of claim 2 wherein the reaction produces a phosphorylated fatty acid ester.
12. (Previously Presented) The composition of claim 2 wherein the reaction produces glycerol ricinoleate and n-propyl ricinoleate.

13. (Previously Presented) The composition of claim 2 wherein the fatty acid ester is dimerized or trimerized.
14. (Cancelled)
15. (Cancelled)
16. (Previously Presented) The composition of claim 2 wherein the acid is phosphoric acid.
17. (Cancelled)
18. (Cancelled)
19. (Previously Presented) The composition of claim 1 or 2 wherein the acid contains a phosphate functional group.
20. (Previously Presented) The composition of claim 19 wherein the composition includes a functional group selected from the group consisting of a phosphate ester functional group
21. (Previously Presented) The composition of claim 19 wherein the composition includes a phosphorus-containing ester functional group.
22. (Previously Presented) The composition of claim 19 wherein the composition includes a phosphorous-containing functionality.
23. (Previously Presented) The composition of claim 2 wherein the compound containing the hydroxyl functional group is an alcohol having a carbon number from C1 to C18.
24. (Original) The composition of claim 23 wherein the alcohol is selected from the group consisting essentially of methyl alcohol, ethyl alcohol, butyl alcohol, pentyl alcohol, hexyl alcohol, heptyl alcohol, octyl alcohol, nonyl alcohol, decyl alcohol, dodecanol, isopropyl alcohol, n-propyl alcohol, glycerol, substituted alcohols and multiple hydroxy functional group alcohols.

25. (Previously Presented) The composition of claim 2 wherein the compound containing the hydroxyl functional group is n-propyl alcohol.
26. (Cancelled)
27. (Cancelled)
28. (Cancelled)
29. (Cancelled)
30. (Cancelled)
31. (Cancelled)
32. (Previously Presented) The composition of claim 2 wherein at least a portion of the composition includes an estolide functional group.
33. (Previously Presented) The composition of claim 2 further comprising a miscibility-enhancement additive effective to increase miscibility with naphthenes, paraffins, alkyl benzenes, mineral oils, polyol esters, polyalphaolefins, polyalkylene glycols, polybutenes, polyvinyl ethers and substituted hydrocarbons.
34. (Original) The composition of claim 33 wherein the miscibility-enhancement additive is selected from the group comprising C10 to C18 long chain alcohols, esters, quaternary ammonium salts and alkyl benzenes.
35. (Original) The composition of claim 33 wherein the effective amount of the miscibility-enhancement additive is from about 0.1 percent to about 10 percent by weight of the composition.
36. (Original) The composition of claim 33 wherein the effective amount of the miscibility-enhancement additive is from about 1 percent to about 5 percent by weight of the composition.

37. (Previously Presented) The composition of claim 2 further comprising reacting the transesterified fatty acid ester with a second compound having an acetyl, alkyl oxy, alkyl propoxy or carboxyl functional group to form a further-substituted fatty acid ester that includes an acetyl, alkyl oxy, alkyl propoxy or ester functional group.

38. (Previously Presented) A composition resulting from the mixture of reactants, the reactants comprising:

25 mol %-36 mol % of ricinoleic acid ;
58 mol% - 62 mol% of alcohol; and
0.8-10 mol % phosphorus-containing acid.

39. (Cancelled)

40. (Previously Presented) The composition of claim 38 wherein castor oil is used to supply the ricinoleic acid.

41. (Cancelled)

42. (Cancelled)

43. (Cancelled)

44. (Original) The composition of claim 38 wherein the acid is phosphoric acid.

45. (Cancelled)

46. (Original) The composition of claim 38 wherein the compound containing the hydroxyl functional group is an alcohol having a carbon number from C1 to C18.

47. (Original) The composition of claim 38 wherein the alcohol is selected from the group consisting essentially of methyl alcohol, ethyl alcohol, butyl alcohol, pentyl alcohol, hexyl alcohol, heptyl alcohol, octyl alcohol, nonyl alcohol, decyl alcohol, dodecanol, isopropyl alcohol, n-propyl alcohol, glycerol, substituted alcohols and multiple hydroxy functional group alcohols.

48. (Original) The composition of claim 38 wherein the compound containing the hydroxyl functional group is n-propyl alcohol.

49 (Cancelled)

50. (Cancelled)

51. (Cancelled)

52. (Cancelled)

53. (Cancelled)

54. (Cancelled)

55. (Cancelled)

56. (Cancelled)

57. (Cancelled)

58. (Withdrawn) A process for lubrication of a lubricant-dependant system with a fluid comprising adding an effective amount of the composition of Claim 2 to the lubricant-dependant system in the fluid.

59. (Withdrawn) A process for increasing heat transfer in a heat transfer system capable of receiving a heat transfer fluid comprising adding an effective amount of the composition of Claim 2 to the heat transfer fluid.

60. (Withdrawn) A process for modification of rheological properties of a hydro-mechanical fluid comprising adding an effective amount of the composition of Claim 2 to the hydro-mechanical fluid.

61. (Withdrawn) A process for inhibition of corrosion for a corrosion-susceptible mechanical system comprising contacting the corrosion-susceptible mechanical system with a fluid having an effective amount of the composition of Claim 2.

62. (Withdrawn) A process for inhibition of moisture for a moisture-susceptible mechanical system comprising contacting the moisture-susceptible mechanical system with a fluid having an effective amount of the composition of Claim 2.
63. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the effective amount of the transesterified fatty acid ester is from about 0.5 percent to 100 percent by volume of the fluid.
64. (Withdrawn) The process of claim 63 wherein the effective amount of the transesterified fatty acid ester is from at least about 5 percent to about 20 percent by volume of the fluid.
65. (Cancelled)
66. (Cancelled)
67. (Cancelled)
68. (Cancelled)
69. (Cancelled)
70. (Cancelled)
71. (Cancelled)
72. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the reaction produces a phosphated fatty acid ester.
73. (Cancelled)
74. (Cancelled)
75. (Cancelled)
76. (Cancelled)
77. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the acid is phosphoric acid.

78. (Cancelled)

79. (Cancelled)

80. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the acid contains a phosphate functional group.

81. (Cancelled)

82. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the composition includes a phosphorus-containing ester functional group.

83. (Cancelled)

84. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the compound containing the hydroxyl functional group is an alcohol having a carbon number from C1 to C18.

85. (Withdrawn) The process of claim 84 wherein the alcohol is selected from the group consisting essentially of methyl alcohol, ethyl alcohol, butyl alcohol, pentyl alcohol, hexyl alcohol, heptyl alcohol, octyl alcohol, nonyl alcohol, decyl alcohol, dodecanol, isopropyl alcohol, n-propyl alcohol, glycerol, substituted alcohols and multiple hydroxy functional group alcohols.

86. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 wherein the compound containing the hydroxyl functional group is n-propyl alcohol.

87. (Cancelled)

88. (Cancelled)

89. (Cancelled)

91. (Cancelled)

92. (Cancelled)

93. (Cancelled)

94. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 further comprising a miscibility-enhancement additive effective to increase miscibility with naphthenes, paraffins, alkyl benzenes, mineral oils, polyol esters, polyalphaolefins, polyalkylene glycols, polybutenes, polyvinyl ethers and substituted hydrocarbons.
95. (Withdrawn) The process of claim 94 wherein the miscibility-enhancement additive is selected from the group comprising C10 to C18 long chain alcohols, esters, quaternary ammonium salts and alkyl benzenes.
96. (Withdrawn) The process of claim 94 wherein the effective amount of the miscibility-enhancement additive is from at least about 0.1 percent to about 10 percent by weight of the composition.
97. (Withdrawn) The process of claim 94 wherein the effective amount of the miscibility-enhancement additive is from at least about 1 percent to about 5 percent by weight of the composition.
98. (Withdrawn) The process of claim 58, 59, 60, 61 or 62 further comprising reacting the transesterified fatty acid ester with a second compound having an acetyl, alkyl oxy, alkyl propoxy or carboxyl functional group to form a further-substituted fatty acid ester that includes an acetyl, alkyl oxy, alkyl propoxy or ester functional group.
99. (Withdrawn) The process of claim 58 wherein the lubricant-dependant system is selected from the group comprising a mechanical device, a refrigeration system, a motor oil system, an engine, an engine part, a gear, a drilling operation and a reciprocating combustion engine.
100. (Withdrawn) The process of claim 58 wherein the composition is capable of providing lubrication at temperatures up to about 350 degrees C.
101. (Withdrawn) The process of claim 58 wherein the composition lubricant is capable of providing lubrication below 0 degrees C.

102. (Withdrawn) The process of claim 59 wherein the heat transfer system is selected from the group comprising a coolant system, a hydraulic braking system, a hydraulic transmission system, a refrigeration system and an air-conditioning system.
103. (Withdrawn) The process of claim 60 wherein the hydro-mechanical fluids are functional fluids.
104. (Withdrawn) The process of claim 60 wherein the hydro-mechanical fluids are selected from the group consisting of radiator fluid, drilling fluid, engine fluid, anti-corrosive fluid, transmission fluid, hydraulic fluid, brake fluid, dielectric fluid, heat transfer fluid and cutting fluid.
105. (Withdrawn) The process of claim 61 or 62 wherein the mechanical system is a reciprocating combustion engine, a hydraulic braking system, a hydraulic transmission system or a coolant system.
106. (Withdrawn) The composition of claim 2 wherein:
- the composition is effective in providing lubrication to a mechanical system;
- the transesterified fatty acid ester has an HLB between about 0.5 and 4.8; and
- the transesterified fatty acid ester exhibits in excess of 1000 pounds force load to failure.
107. (Cancelled)
108. (Withdrawn) The substance of claim 106 wherein the compound containing a hydroxyl functional group is *n*-propyl alcohol.
109. (Withdrawn) The substance of claim 106 wherein the acid is phosphoric acid.
110. (Withdrawn) A process for cleaning mechanical system comprising contacting the mechanical system with a fluid having an effective amount of the composition of claim 2.
111. (Withdrawn) The transesterified fatty acid ester of claim 110 wherein the fatty acid ester is ricinoleic acid.

112. (Withdrawn) The transesterified fatty acid ester of claim 111 wherein the compound containing a hydroxyl functional group is n-propyl alcohol.

113. (Withdrawn) The transesterified fatty acid ester of claim 111 wherein the acid is phosphoric acid.

114. A method of creating a phosphorus-containing composition comprising the steps of:
reacting a fatty acid ester comprising ricinoleic acid with an alcohol in the presence of a
phosphorus-containing acid such that the reaction products include a transesterified fatty acid
ester and a phosphorus-containing compound.